

A Novel Biomass Derived Low-Cost Mesoporous Carbon

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The integration of advanced processing with recyclable and green precursors is a key requirement in the development of modern materials systems which are designed to address the current problems of society rather than to add to them; resulting new materials will therefore have acceptable and sustainable environmental pedigree.

In this talk, we focus on a low-cost mesoporous carbon synthesized from cheap biomass precursors. The materials, which can be synthesized in powder or monolith form, have tuneable pore dimensions in the 2 to 4 nm range and are mechanically robust. The materials, in monolith form, have thus far found use in commercial air purification units¹ and in solar powered desalination devices²; in powder form, the pore size distribution makes them ideal candidate carbons for supercapacitors, as well as anodes in Li⁺ and Na⁺ ion batteries. The materials have also been impregnated with dispersed nano-metal particles (Ag and Au) for respiratory protection applications. In our talk, detailed characterizations of micro and nano structures, porosity, surface chemistry and metallization characteristics along with performance data for some early commercial devices will be presented.

References

1. <https://www.gov.uk/government/news/uk-shanghai-collaborations-pioneering-businesses-win-funding>

2. F. Liu, B. Zhao, W. Wu, H. Yang, Y. Ning, Y. Lai, R. Bradley, Low Cost, Robust, Environmentally Friendly Geopolymer-Mesoporous Carbon Composites for Efficient Solar Powered Steam Generation, ***Advanced Functional Materials***, <https://doi.org/10.1002/adfm.201803266>, 2018.